

SAFETY DOOR FOR NURSERY SCHOOLS, KINDERGARTENS AND LIKE ENVIRONMENTS

BACKGROUND OF THE INVENTION

Prior art relating to the design of doors and surrounding casing structure includes types of door stops as well as various devices and attachments directed to preventing injury to a person who may catch a hand or finger in the door when it is closed.

Examples of such art are found in U.S. Pat. Nos. 4,040,142, 2,686,942, 1,829,312, 2,065,685, 1,258,856, 2,846,713 and 3,800,360. Each of these patents is directed to some type of apparatus which is attached to the door structure as needed at a time after the door is installed in use. Certain of these devices are directed to means for preventing the fingers or hands being caught in the hinged connection between the door and adjacent structure. However, most of these devices are not designed for and do not prevent the fingers getting into the hinged area. Instead, they are primarily directed to preventing the door closing upon the fingers. The patent to Ippolito, U.S. Pat. No. 4,040,142, discloses a bellows-type apparatus installed such that when the door is opened a folding panel extends across the grooved opening formed opposite the hinges such that a hand or fingers cannot be placed therein. However, when the door is not fully but only partially opened, the bellows panel as described will not fully extend and a person may still get a hand or fingers caught therein and pinched between the door and casing. This same deficiency exists in other such devices known to the present applicant.

Apparatus directed simply to a door check is described in U.S. Pat. No. 3,800,360 to Knarreborg. The door check described therein also includes a noise silencing bumper in the form of a pendulous device or bumper which is adapted to momentarily lodge between the door and the casing and then, as the door approaches the final closing stage, the bumper automatically tilts away to land in a neutral position and permit the door to close. This patent and others similar are primarily designated to impede or slow down the closing of a door rather than fully prevent the closing.

Other patents, including the above cited U.S. Pat. No. 2,686,942, disclose the positioning of a resilient bumper or guard along the casing or jamb adjacent the free edge of the door to reduce injury to extremities caught therein. However, these devices as disclosed do not overlie an adequate surface area to completely prevent injury. As generally described these guards are installed in an intermediate area of the jamb to engage the door edge when in a closed position. Therefore, it is quite possible to pinch a hand or finger between the door edge and an unpadded area of the jamb.

Examples of finger injury preventive devices for car doors are shown in U.S. Pat. Nos. 2,065,685 and 1,829,312; however, they are both considered to be partially or totally ineffective in a substantial number of cases.

The above problems are particularly significant in an environment where young children are present such as in daycare centers and nurseries. In such an environment it is desirable to have doors which are specifically designed to prevent injury to a child should the hands or fingers be caught in either the hinged edge or free edge of the door structure.

SUMMARY OF THE PRESENT INVENTION

A safety door and surrounding casing or jamb have been designed primarily for use in an area where small children are present. The door structure features multiple safety features which cooperatively interact to significantly reduce and hopefully eliminate the likelihood of injury to a child by the normal operation of the door.

Specifically the safety elements on the door are designed to: (1) prevent the placement of hands or fingers in the front or rear hinged area of the door and casing when the door is opened to any degree; and (2) prevent the hands or fingers from being pinched between the free edge of the door and adjacent casing by preventing closure thereof or even if the door closes completely.

The door structure as taught by a preferred embodiment includes a conventional door and surrounding casing with the door having one vertical side hingedly connected to the adjacent side wall of the casing. The safety elements function to protect a child positioned adjacent either face of the door, and include flexible panels which overlie and shield the inner and outer gaps (to the front or rear of the door respectively) formed between the open door and casing at the hinged side; and a free side protective means which may be either a pivotally mounted door stop which is selectively set in a tilted position such that it automatically falls downwardly to extend between the free edge of the door and the adjacent casing wall when the door is opened; or a soft edge along a significant portion of the free edge of the door whereby the hard portion of the door panel cannot pinch the fingers or hand when closed.

The shield means for the front and rear faces of the hinged side of the door overlie and conceal the gap between the door and casing to prevent the insertion of hands or fingers thereinto regardless of the degree to which the door is opened. The first shield means includes a panel of flexible sheet material mounted on what will be considered the forward or inner face of the door structure. One lateral edge is fixedly attached to the closure strip of the casing and the panel extends laterally across the gap therebetween to a point where the opposing lateral edge is held in slidable relationship to the front surface of the door. As the door is opened and swung rearwardly the inner or front door edge will slide relative to and concealed by the shield so the shield will extend across the gap. As the door closes the shield will slide laterally toward the center of the door; at all times during operation of the door, remaining in a position overlying the gap.

The second or rearward shield comprises a vertically elongated, relatively narrow panel of flexible sheet material fastened along one vertical edge to the rear surface of the casing, and along the opposing edge to the rear surface of the door. The shield is of a width sufficient to cover the rearward gap. When the door is opened the shield flexes or bends against itself so as not to impede operation of the door.

In a preferred embodiment both the front and rear shields extend vertically substantially the height of the door structure except for the area covered by the hinges on the rear side. Thus it would be highly improbable that a child of any age or stature could injure a hand or finger therein.

The aforementioned door stop or checking device is mounted, in the preferred embodiment, on the inner surface of the door adjacent the upper portion of the free side. The actual stopping element is pivotally